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USEFUL RECEIPTS.

To Extract the Coloring Matter from Dye Woods.

A new process for the purpose of obtaining a solid extract, says the "Invention," has been contrived by MM. Varillat and Tornezy, of Rouen, France. Instead of evaporating and concentrating, in the open air, the solution of dye wood that contains the coloring matter, it is proposed to obtain the concentration not exposed to its influence. The evaporation is performed much quicker and at a lower temperature, in a vacuum, than in the air; moreover, the serious inconveniences that result from the contact of the air with the coloring matters are thus avoided. It is well known that the action of the air, combined with that of the heat, produces an oxydizing of these substances, which destroys the brightness of the greater part of them. To this circumstance must be attributed the want of success experienced in the attempts that have been made to obtain solid extracts, by evaporating, in contact with the air, solutions of dye woods. To the same cause, also, must be attributed the marked inferiority of the liquid extracts of commerce, when compared with solutions newly prepared. We believe, adds the "Invention," that this branch of industry, which is destined to be of great service by causing, at the same time an economy of wood, time, manual labor, and freightage has taken a stride that will bring it out of the oblivion and stagnation into which it has been plunged for so long a time.

Varnish for Iron Work.

Locksmiths and others working at the forge are accustomed to blacken the articles intended for railroads by making them red hot and burning on them some linseed oil. This plan which is practised to improve the appearance of the articles, and to protect them from rusting is not economical nor always successful, it fails when the combustion of the oil has been too great.

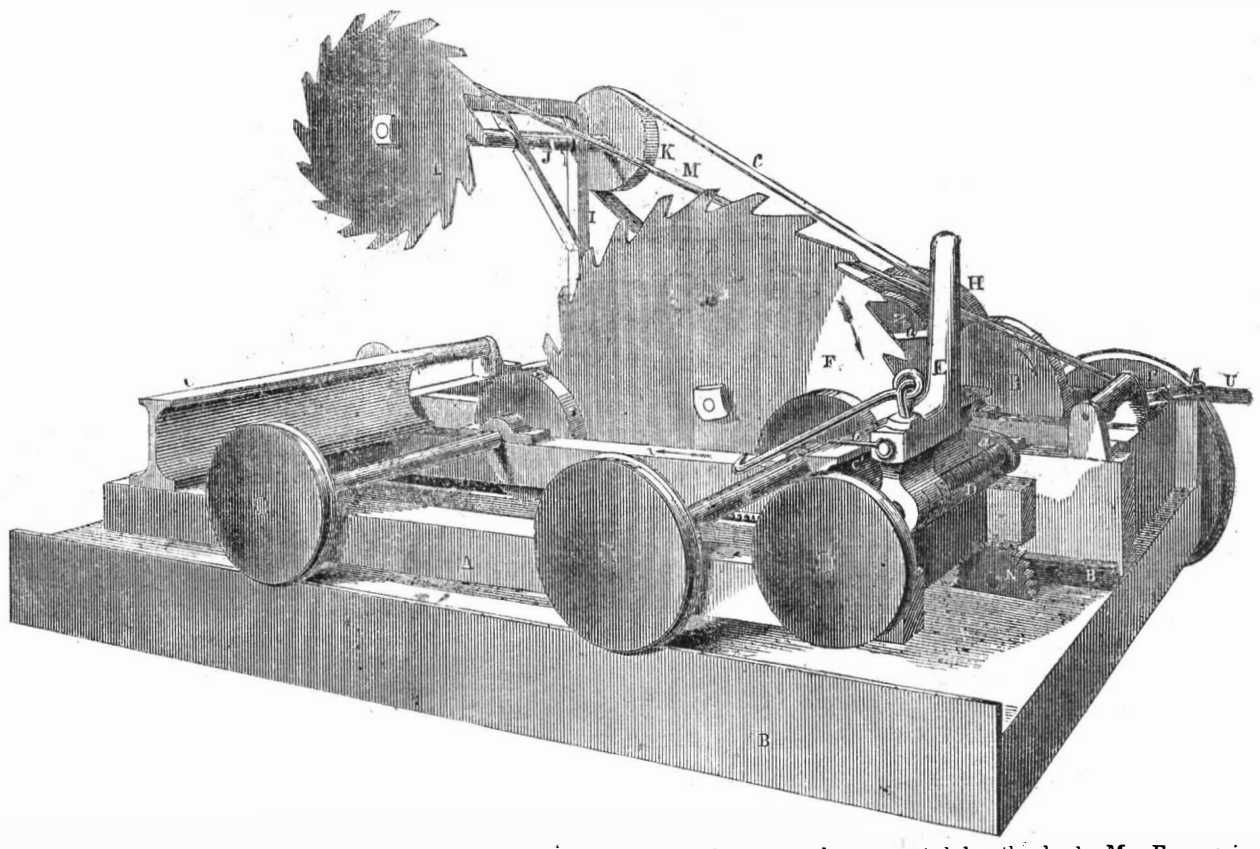
By the following process a varnish is made without the above disadvantages, and which gives to articles a better appearance:—

Dissolve, in about 2 lbs. of tar oil, something more than half a pound of asphaltum and a like quantity of pounded rosin; the mixing is performed hot in an iron kettle, care being taken to prevent any contact with the flame. When cold the varnish is poured into a vessel and kept for use. These varnishes are for outdoor wood and iron work, not for japanning, leather, or cloth. Oil varnishes are used for patent leather, and copal for japanning metal.

New Varnish.

A majority of varnishes are composed o. gum and water colors. Made in this manner they are easily changed by water. The following does not possess this inconvenience. It is composed of water, potash, and gum lac in the following proportions:—Water 3 quarts, gum lac 2 lbs., potash mixed with lime 4 ounces. If desired, other resinous bodies less expensive may be substituted for the gum lac.

IMPROVEMENT IN SAW-MILLS.---Figure 1.



The annexed engravings are views of improvements in Saw Mills, invented by Stephen Lewis, and E. J. Horn, of Addison, Steuben Co., N. Y., who have taken measures to secure a patent for the same.

Figure 1 is a perspective view; fig. 2 is a plan view of the feed gearing; fig. 3 is a side view of fig. 2. The same figures refer to like parts.

A is a carriage of ordinary construction, placed upon ways, B B. The log to be secured rests on the beds, C C'. On the outer side of bed C', there is a screw rod, D, which has its bearings in projections, *a a*, attached to the ends of the bed. The dog, E, is placed upon the screw rod, also a pulley on its outer end. This screw rod works through a nut cut in the shank of the dog; there is a small hook, *b*, which catches over the top of bed, C' and secures the dog in a vertical position. The dog holds the log on the beds of the carriage, and as a board is sawed off the log, the dog is moved a corresponding distance transversely, to make the saw cut the next board; this is done by turning the screw rod, D. A log may be placed upon the beds from the outer side of the carriage, by turning the dog, E, over and downwards on the screw rod, which could not be done, if the said dog was kept in a vertical position, hence the advantage of this arrangement. In saw mills, dogs are always set in a vertical position, and the carriage must be gigged back, when a fresh log is placed upon it, in order to clear the saw, &c., and the log is placed on the carriage from the inner side. When it is designed to turn down the dog, the small hook, *b*, is raised, so as to free it from the bed. F is a circular saw, hung at one end of a shaft, G, on the opposite end of which is the driving pulley, H. I is a jib at one corner of the frame; it is made to turn in its socket. J is a spindle which works in suitable bearings in the jib frame; on one end of the spindle is a pulley, K, and on the other a circular saw, L; this spindle is driven by a band, *c*, passing over pulley, K. The jib is represented in position with the two saws, E L, in line; these two saws cut out the board—the large saw acts upon the under, and the small one upon the upper side of the log. By this arrangement circular saws of a very large diameter are not required, like as when only one saw is employed; large circular saws are very expensive. The jib, I, is kept in the position represented by the hook, M. For sawing small logs, the saw, F, only is required, and the jib can then be turned round by releasing the hook, so as to swing the small saw to the one side.

Figure 2.

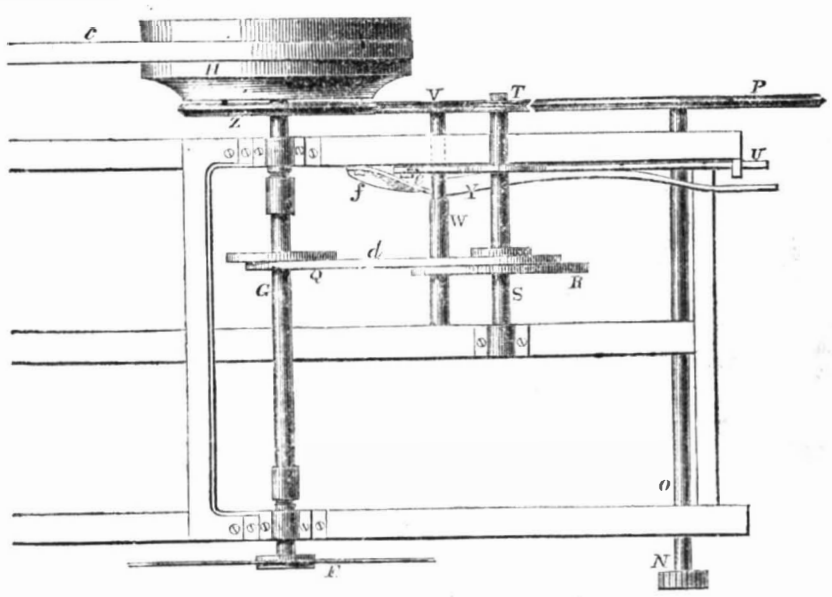
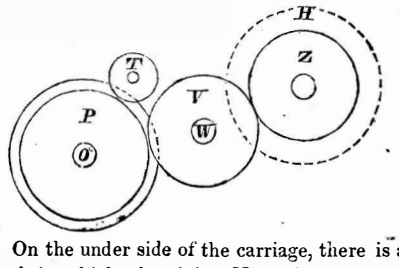


FIG. 3.



On the under side of the carriage, there is a rack in which the pinion, N, meshes to move it. P is a pulley on the opposite end of shaft O; it has a bevelled periphery as seen in fig. 2. Q is a small pulley on shaft, G; *d* is a band passing over it and the pulley, R, on shaft S; on said shaft is a pulley, T, having a grooved periphery; it bears against the pulley P. When the driving pulley, H, is turned in the direction indicated by the arrows, the pulleys, R T and P, and pinion, N, will revolve in directions according to their connection and belting, and the carriage, A, will be fed to the saw, F, in line, as shown by the horizontal arrow, 1, fig. 1. The shaft, S, in which the pulley, R, is hung, passes through a lever, U, having its fulcrum at *e*, fig. 2. V is a pulley, with a grooved periphery; it is hung on shaft, W; underneath it is a lever, Y, the fulcrum of which is at *f*, fig. 2. Z is a pulley on shaft, G; it also has a bevelled edge. The pulleys, V, T, and P, are in line, but the one, Z, is placed a little out of line. The reverse motion of the carriage to that of feed, which has been described, is obtained by raising lever U, which throws the pulley, T, out of gear with P. The lever, Y, is then raised, and the one, V, is made to bind against the pulleys, P and Z, by which a reverse motion is given to P, pinion N, and consequently to carriage A. The object in having pulley V a little out of line, is to draw the log from the saw, when the reverse motion is given to the carriage. The pulley, V, having a grooved edge, and the pulley, Z, being bevelled, when V is raised by elevating lever, Y, the groove in the one pulley draws the bevelled edge of the other snug-

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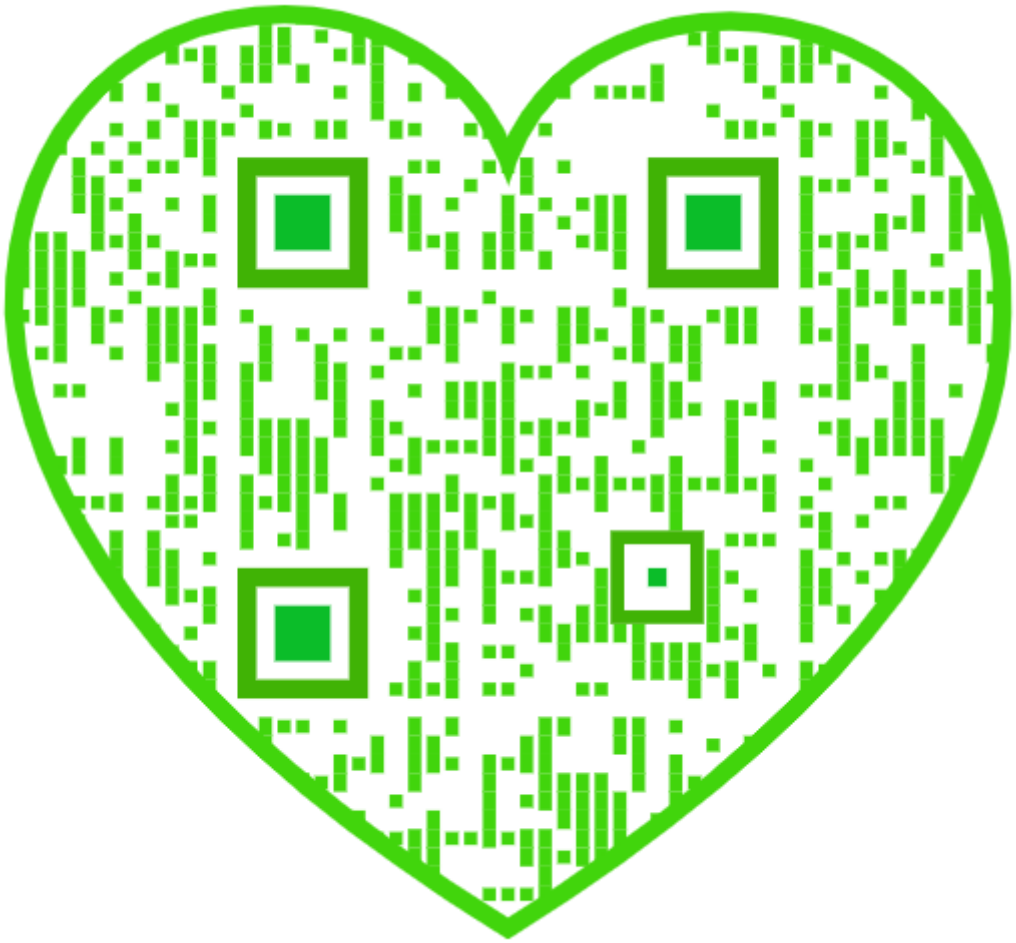


ly into it, and as Z is nearer the saw, F, than V, the saw will be thus drawn from the log—the shaft, G, being allowed the necessary vibration to do so.

The movable dog, E, is a valuable improvement, because it can be turned over backwards, and logs placed on the carriage from the outer side without the trouble of gigging back. The jib and auxiliary saw is also a useful arrangement, by which one or two circular saws can be employed for logs of different sizes. The gearing by which the feed and return motions of the carriage are accomplished, is also a valuable arrangement. These improvements, as described, will render the matter clear to all.

More information may be obtained by letter addressed to the inventors.

MISCELLANEOUS.

New Patent Law in Austria.

The following is the section of the new Patent Law in Austria concerning foreigners:—

"No exclusive patent for an invention, discovery, or improvement that is introduced from other countries, will be granted except when the application is restrained likewise in other countries to an exclusive patent. But it is only the possessor of the foreign patent that can obtain in Austria an exclusive patent. Under these restrictions, no patent for an invention, discovery, or improvement made abroad, but which has not yet been applied for in that country, can be granted.

The number of years for which a patent is granted cannot, without the consent of the sovereign, exceed fifteen years, and with regard to patents granted abroad, and of which the possessor would wish to have the advantages in Austria, their duration is limited to the number of years that the patents have to run. If an exclusive patent is granted to a foreigner, he can possess, as if he were a native of the country, all the advantages and privileges attached to such a patent; that is to say, the patent assures to the patentee the exclusive benefit of his invention for the number of years mentioned in it. The patentee is entitled to form, in every part of the kingdom, any establishment, and to employ all the requisite operatives for the perfect carrying out of the object for which the patent has been granted. He can, besides, authorize other individuals to employ his invention protected by his patent, dispose of his patent as he thinks expedient—will, sell, or let it out. The patent dues are proportioned to the length of time, and are the same for a foreigner as for a native of the country. The whole sum is to be payed at once for the full length of time for which the patent is solicited, and is to be payed at the time of filing the petition. If the petition is refused, the money will be returned, but if it is granted, there will be no restitution unless the patent, after it has been granted, should be annulled for public reasons, and only for the number of years that the patent has yet to run.—[L'Invention.

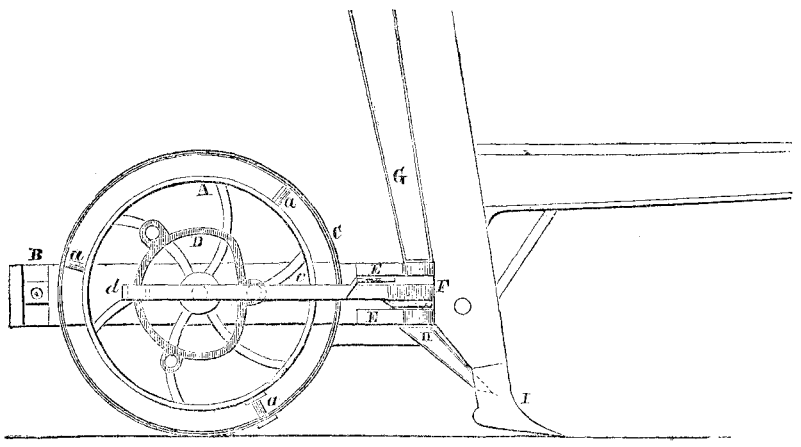
The chemical lecture of Prof. Wright, on the "Atmosphere," will appear in our next number; also the criticism on "Hot Air Engines, showing how they have Failed."

Great Tunnel.-- Dayton and Cincinnati Short Line Railroad.

The contract for the tunnel on this railroad E. Gest, Chief Engineer, has been made, and we suppose the work will proceed with all despatch. The actual tunnelling is 8,000 feet, but the arched approaches amount to 1,300 making the total length of tunnel 9,300 feet. The contracting price for the work is $553,-861. It is a work of great magnitude, and from the abilities of the Chief Engineer, the workmanship will be well done, not like the wretched tunnel on the New York and Harlem Railroad, which is continually falling, to the great danger of life, limb, and property. We have the specification of this new tunnel before us, it is complete. At the distance of 2,000 feet from one another, there are to be three shafts of 160, 175, and 135 feet deep to the top of the tunnel. The tunnel will be 29 feet wide, and 29 feet deep. The walls are to be built in the most thorough manner. The shaft walls will spring from a cast-iron frame inserted in the arch of the tunnel. The work is to be driven night and day with a double set of hands, and the whole is to be complete and ready for the cars in 22 months from the 20th of last month (Nov.) The excavation will be through blue limestone and indurated marl.

The shoe trade in London is divided into twenty branches, such as the shoeman or maker of the sole parts of the shoe; the bootman, or maker of the sole parts of the boot; the foot-closer, or joiner together, of the leg, vamp, &c.

IMPROVED SEED PLANTER.---Figure 1.



The annexed engravings are views of a seed planter, invented by Daniel Haldeman, of Morgantown, Monongalia Co., Va., and for which a patent was granted on the 5th of last October, (1852)

Fig. 1 is a side view of the wheel or roller showing one of the cams and also one of the slides, the iron plate and tubes through which the seed passes into the furrow. Figure 2 is a side elevation of the machine; figure 3 is a detached plan showing the wheel or roller with the cams attached, the slides and iron plates being represented by dotted lines; figure 4 is a front view of the slides showing the manner in which they work over the iron plate. Similar letters of reference indicate corresponding parts in each of the several parts.

The nature of the invention consists 1st in having the wheel or roller encompassed by one or more tyres which may be adjusted to the wheel or roller at pleasure, thus increasing or diminishing the diameter of the wheel, and allowing the seed to be planted the required distance apart as will be hereafter shown.

A represents the wheel or roller placed within a suitable frame; B C represents a tyre placed around the wheel and adjusted to it by set screws, *a*, figures 1 and 2. These screws by being relaxed allow the tyre to be removed. There may be one or more tyres as desired, every tyre that is added increasing the diameter of the wheel; for instance, if the diameter of the wheel, A, be three feet, and the outer surface of the tyre, C, be three inches from the periphery of the wheel, the diameter of the wheel will be increased six inches by employing the tyre. The object of employing the adjustable tyre or tyres will presently be shown.

D D are two cams, one on each side of the wheel, A, these cams are secured to the wheel in any proper way. Their shape will be seen and understood perfectly by referring to figures 1 and 2. They may be described as being D shaped, or a circle with a segment cut off. The cams, however, may vary somewhat in shape from those represented and effect the same object. The cams are reversed, that is if the flat surface *b*, of one cam is nearest the beam or front of the implement, the flat surface of the other cam will be in an opposite position or the furthest point off from the beam or front of the implement, see figure 3. E E are two slides which are operated by the cams. These slides have shanks, *c c* with projections, *d*, at their ends, between which the edges of the cams fit, see figure 3. At the opposite ends of the shanks are the slides, which are flat square flutes, working in slots in the front part of the frame, B; both sides are curved or bent, one upwards and the other downwards, see figure 4. This allows a space between, in which a metal flute, F, is fitted, see figure 2, and dotted lines in figure 4, the plate, F, being fitted in a mortice. This plate has a hole or aperture through it of sufficient size to allow seed to pass through, see dotted lines. In line with the aperture through the plate are holes in the frame both above and below the plate, see figure 2. A tube, G, communicates with the top hole, and a tube, H, with the lower hole, see figures 1 and 2. The upper tube, G, contains the seed, while the lower tube, H, conveys it to a recess in the share I, and it falls into the furrow made by the share as the implement is drawn or moved.

Figure 2.

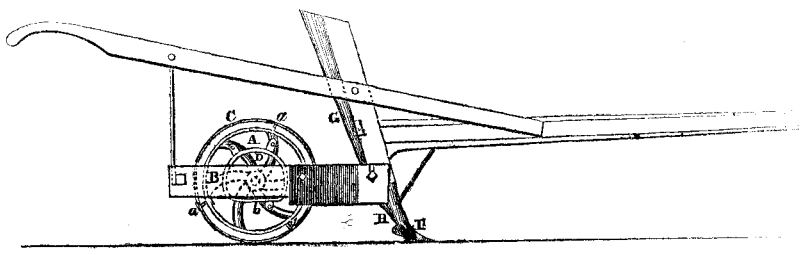
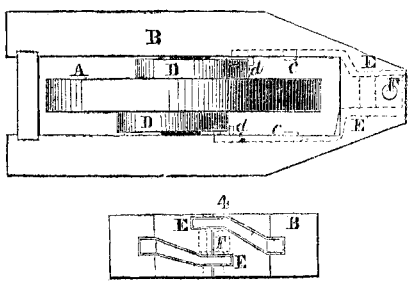


FIG. 3.



The slides have a reciprocating motion given them by the cams as will readily be seen, and as the cams are attached to the wheel relatively in a reverse position, of course one slide will be thrown forward while the other is drawn back. The slides work in slots one directly over, and the other immediately underneath the metal plate, F, so that when the upper slide is drawn back the seed will pass from the tube, G, and fall into the aperture in the metal plate, F, the aperture being closed at the bottom by the under slide which is thrown forwards, and when the under slide is drawn back the seed passes from the aperture and falls into the tube, H, and is conveyed into the furrow, the upper slide being thrown forwards and covering the aperture in the plate, F, at the top, while the lower slide is drawn back.

Thus the slides, E E, have a reciprocating motion, working alternately, allowing no waste of seed, and distributing the seed in an even and sure manner.

The object in using the adjustable tyre or or tyres is, that the larger the diameter of the wheel, A, is, the slower the slides operate; consequently where it is desired to have the seed dropped three feet apart the wheel must be three feet in circumference, or one foot in diameter. Now, by adding the tyres the space between the hills where seed will be deposited will be increased according as the diameter of the wheel is enlarged. Thus, by having a series of tyres, they may be adjusted to the wheel so that the seed may be planted at any reasonable distance.

More information may be obtained by letter addressed to the inventor.

Recent Foreign Inventions.

TREATING MATTERS CONTAINING ANTIMONY, LEAD, TIN AND SILVER.—Thomas Richardson, of New-Castle-upon-Tyne, patentee — The first part of this invention relates to the separation of metallic oxydes from one another.

1st. Mixed oxydes containing lead and antimony, or lead and tin, obtained during the process of softening hard lead of commerce.

2nd. Also the mixed oxydes of tin and copper produced by calcining the waste alloys of these metals in a reverbatory furnace under the action of hot air. The first class of oxydes are treated with nitric or acetic acids by which the lead is obtained as a nitrate or acetate, and the tin and antimony left for subsequent conversion by any of the known ways to a marketable commodity.

The second class of oxydes are acted upon by acetic or sulphuric acid, to obtain the copper as an acetate or sulphate, which can be separated by washing, leaving the tin to be converted into a metallic state, or used in making the muriate of tin in dyeing.

The mixed oxydes of lead and antimony can also be reduced by calcining them, mixed with coal and an alkali. To 20 cwt. of the mixed oxydes, 1 cwt. of coal and 30 lbs. of soda are added and all mixed together. These are roasted in a suitable furnace until the lead is converted into a red oxyde which may be washed and dried and used as a paint, or in the manufacture of glass. The antimony is separated in a metallic state from the lead.

This patentee also treats the sulphuret ores of lead in a reverbatory furnace gradually increasing the heat to expel the sulphur, after which the usual smelting process is continued.

SOAP.—Charles Thomas, of Bristol, Eng., patentee.—This patent is for pressing soap in the frames by fluid pressure of a fluid possessed of a greater specific gravity than soap, such as an alkaline solution. This is forced into the lower part of the frames as the soap shrinks by cooling. The temperature of the compressing fluid ranges between 160° and 200° Fah., in order that the soap may not be unduly cooled by contact with it.

SEPARATING SILVER AND LEAD FROM REFUSE OF GALENA.—H. L. Pattison, of New-Castle-upon-Tyne, patentee.—The patentee manufactures oxychloride of lead from galena, by the use of hydrochloric acid, but the refuse of the galena contains a portion of lead mixed with earthy matter and all the silver formerly existing in the ore is still retained. This residue is smelted in a reverberatory furnace with 1 part of common salt to 4 parts of the residuum, and a part of iron filings, by weight. These materials, when melted are run into a conical mould, and when cold, it will be found that the lead and silver have settled to the bottom and may be broken off, and the slag remelted on a common slag hearth.

Our Last Number, and Engravings.

Our last number was not so well illustrated as we could have wished. It is not possible to have every number alike, owing to the subjects, which are to be described and illustrated. We have made up for the difference in this number, and our readers may always depend on us, to make every number a good and useful one, however different one may be from the other.

A manufacturer in Wurtemburg has invented a mode of applying a surface coating to sheet-iron, which enables it take freely the mark of a slate-pencil. It is said to be much lighter, and much less liable to injury, than a common slate.

The late advices from England have caused another rise in iron. Common bars have sold at New York as high as $62,50 and rails at $70 a ton.

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Machinery and Tools as they are.—The Steam Engine.

(Continued from page 115)

STEAM GAUGES—Before concluding with the Steam Engine, a few remarks appear to us necessary to be made respecting the various apparatus that we have classified under the above head. Most of these are very ingenious instruments, and out of the many inventions, we have selected those that hold the highest rank for the purpose of describing them. The merit of a piece of machinery is not to be regulated by its size; and some of the instruments invented for the object of testing the power, safety, or efficiency of the steam engine, are, although so small and apparently insignificant in comparison, almost as wonderful specimens of ingenuity and talent as the steam engine itself. The following are the principal instruments of the kind alluded to:—

The Dynamometer.—The Dynamometer is constructed in several different forms, and is an instrument for measuring the intensity of any active power; in steam machinery it has been mostly employed to gauge the exact amount of pressure given off by the screw-shaft, or, in fact, the power exerted by the engine to propel the vessel. When employed for this purpose, the dynanometer is merely a lever or a combination of levers, the shaft pressing near the fulcrum, and the further end of the lever being attached to a spring balance, in this manner indicating the amount of thrust or pressure in pounds. There are several ways of arranging the lever—sometimes it takes the pressure from the end of the shaft, at other times from a revolving frame with a number of friction rollers in it, which work against a collar in the shaft at any part that may be most convenient. This instrument, like all extremely sensitive meters should work with as little amount of friction as possible. The rod connecting the lever with the spring balance has a small sliding rod attached to it carrying the pencil; a cylinder having a slip of paper round it, is placed contiguous to the pencil, and a rotary motion being given to the cylinder by a band from the screw shaft, a diagram is traced on the paper. We will not enter into the minutiæ of this instrument, but would observe that adaptations of it can often be applied with signal advantage to other descriptions of steam engines, particularly in places where it is customary to hire steam power, as the amount employed by each tenant can be directly ascertained. There are two or three modes of constructing the instrument well adapted for this or similar purposes.

The Indicator.—The Indicator is perhaps the most ingenious contrivance employed by the machinist to measure the effective working of an engine. By its use we obtain certain information on two important subjects of inquiry—in the first place it enables us to discover whether there are any defects in those parts of the machinery by which the steam is admitted to the piston: for example, whether the slide is properly adjusted and steam-tight, whether the steam-ports are of proper dimensions, and of many other details which, if defective, would detract from the efficiency of the engine. In the second place it exhibits, at any time and under all circumstances, what is the actual power of the engine. This instrument consists of a small cylinder placed in connection with the cylinder of the steam engine, either above or below the piston. The cylinder is open at the top and is fitted with a piston, which presses against a spiral spring. The cock which connects the indicator with the cylinder of the engine being opened, steam is admitted under the piston of the indicator during one stroke, and a vacuum occurs during the other, precisely as in the large cylinder, thus causing the small piston to push or pull alternately against the spiral spring. If the pressure were uniform throughout the stroke, the indicator's piston would start at once from top to bottom, and vice versa, remaining stationary until acted upon by the opposite pressure. In such a case the pressure exerted would be simply proportional to the flexure of the spiral spring, and might be measured accordingly, but the pressure on the piston is continually varying during each stroke, hence the pressure on the spring is also varying. These changes of pressure can be recorded if a pencil is attached to the piston-rod of the Indicator, and a paper so placed as to receive the marking of its position, but if this paper were to maintain a fixed position it is evident that the pencil, in its vertical motion, would trace only one straight line, and the variations of pressure (in the course of a stroke) could not be distinguished; this difficulty is surmounted by fixing the paper on a drum and giving it a reciprocating circular motion, so that a continuous curved line is traced upon the paper. But previously to taking a diagram or connecting the Indicator with the steam cylinder, the drum, with the paper attached, is set in motion, and the pencil then describes a straight line (called the neutral or atmospheric line), which represents the pressure of the atmosphere; the space over this line being the measure of the pressure above the pressure of the atmosphere, and the one beneath the line the pressure less than that of the atmosphere. The scale commonly used is divided into limits of an inch, each division representing one pound pressure on the square inch of the piston. When the figure is made the pressure is calculated by drawing lines across it at right angles to the atmospheric line. We have not space to describe all the applications of this excellent instrument, but before finishing its description, will take occasion to remark on the want of an Indicator whose action should be continuous, so as to present a complete record of the working of the engine. Some attempts at such an instrument have been made, but we are not aware of one in successful practice.

The Counter—This instrument was originally invented by James Watt to ascertain the duty performed by the engines that he made, an important point to him, as he was accustomed to be remunerated for their use by a percentage on the saving in fuel that was effected. The name imports its office, and its use has extended from the steam engine to many branches of industry, printers using an adaptation of this instrument to register the number of sheets pulled, and Bridge Ferry Companies often checking the toll-collectors by its employment. It is now made in several different forms, but the original shape is still often retained, which is, to have a series of clock wheels so arranged that when the first has moved the space of the teeth, the next will move one tooth, and so on through the whole series. Before each wheel is a small dial, divided into ten parts, so that if the first dial counts units, the second will count tens, the third hundreds, and so on. From this arrangement the number of strokes made by an engine can be read off by glancing at the dials; the most compact way is to supersede the use of the dials by causing each wheel to present only one figure at a time. It is perhaps needless to say that the first wheel is moved by a rod connected to some part of the engine, a neat differential motion has also been used in the construction of a compact counter.

Vacuum Gauge—The principle on which a barometer acts has been made available for several excellent gauges among which is the barometer or vacuum gauge for showing the condition of the condenser. In its ordinary form it differs little from the barometer except that the top of the glass tube communicates through a small pipe and cock with the interior of the condenser, which has only a partial vacuum instead of the Torricellian vacuum. This kind of vacuum gauge is not perfectly correct owing to the pressure of the atmosphere varying, and also from the level of the mercury in the cup often changing, for which reason a syphon tube is frequently used.

Manometer.—The Manometer gauge differs from that just mentioned which only shows the weight of the column of elastic fluid whereas this shows the density, a circumstance depending on the combined effect of weight and the agency of heat. The theory of the action of the manometer will be best understood by supposing a glass tube full of atmospheric air to be inverted in a reservoir of mercury when the mercury will rise in it to nearly the level outside, now increase the pressure on the surface of the reservoir by turning on the steam, and the mercury in the tube will rise higher according to the pressure so that if a correctly graduated scale be attached, the pressure exerted by the steam will be known. In this form, however, the gauge had defects which prevented its general use but recent improvements have been made which render it more serviceable and better adapted for the purpose for which it is intended.

The common steam gauge consists of a tube bent like a syphon, one end communicating with the boiler and the other with the atmosphere: mercury is then poured in, so that the steam, pressing down the column in one leg, it will rise in the other, and a scale being attached, the pressure can be read off. It is usual to employ an iron tube with a float placed in the mercury, the stalk of the float rising through the tube and pointing to the scale.

The glass water-gauge is merely a glass tube placed in a brass casing, which is situated on the front of the boiler, so that by turning a couple of cocks the relative height of the steam and water is exhibited.

Salinometers are instruments applied to marine boilers to exhibit the degree of saltness of the water; in shape and material they are generally glass bulbs, operating on the principle of the hydrometer, and rising to the surface when the water is too concentrated.

The improvements that have been made for regulating the supply of feed water and for giving an alarm when requisite, we will not here describe, as they cannot strictly be included under the head of gauges.

(To be Continued.)

Fresh Polar Expedition.

Dr. Kane, at the last monthly meeting of the New York Geographical Society, informed those present that another expedition in search of Sir John Franklin was preparing, under his direction in the "Advance" the plan of search to be based upon the probable extension of the land masses of Greenland to the far north—a view yet to be verified by travel, but sustained by the analogies of Physical Geography. The point to attain would be the highest attainable point of Baffin's Bay, from, if possible, pursuing the sound known as Smith's Sound, advocated by Baron Wrangell, as the most eligible site for reaching the North Pole.

As a point of departure, this is two hundred and twenty miles to the north of Beechey Island—the starting point of Sir Edward Belcher—and seventy miles north of the utmost limits seen or recorded in Wellington Channel.

The party should consist of some thirty men, with a couple of launches, sledges, dogs, and gutta percha boats. The provisions would be pemmican—a preparation of dried meat packed in cases, impregnable to the appetite of the Polar bear.

Dr. Kane gave the following account of the proposed expedition:—

"We shall leave the United States in time to reach the Bay at the earliest season of navigation. The brig furnished by Mr. Grinnell for this purpose is admirably strengthened and fully equipped to meet the peculiar trials of the service. After reaching the settlement of Uppernavik, we take in a supply of Esquimaux dogs, and a few picked men to take charge of the sledges.

We then enter the ice of Melville Bay, and, if successful in its penetration, hasten to Smith's Sound, forcing our vessel to the utmost navigable point, and there securing her for the winter. The operations of search, however, are not to be suspended. Active exercise is the best safeguard against the scurvy; and, although the darkness of winter will not be in our favor, I am convinced that, with the exception, perhaps, of the solistical period of maximum obscurity, we can push forward our provision depots by sledge and launch, and thus prepare for the final efforts of the search.

The sledges which constitute so important a feature of our expedition, and upon which not only our success but our safety will depend, are to be constructed with extreme care. Each sledge will carry the blanket, bags, and furs of six men, together with a measured allowance of pemmican. A light tent of india rubber cloth of a new pattern, will be added, but for our nightly halt the main dependence will be the snow house of the Esquimaux. It is almost incredible, in the face of what obstacles, to what extent a well-organized sledge party can advance.—The relative importance of every ounce of weight can be calculated, and the system of advanced depots of provisions organized admirably.

Alcohol or tallow is the only fuel, and the entire cooking apparatus which is more for thawing the snow for tea-water than for heating food—can be carried in a little bag.—Lieut. McClintock of Commander Austen's expedition, travelled thus 800 miles; the collective journeys of the expedition equalled several thousand, and Baron Wrangell made, by dogs, 1,533 miles in seventy four days, and this over a fast frozen ocean.

But the greatest sledge journey upon record is that of my friend, Mr. Kennedy, who accomplished nearly 1,400 miles, most of it in mid winter, without returning upon his track to avail himself of deposited provisions. His only food—and we may here learn the practical lesson of the traveller to avoid unnecessary baggage—was pemmican, and his only shelter the snow house.

It is my intention to cover each sledge with a gutta percha boat—a contrivance which the English have shown to be perfectly portable. Thus equipped, we follow the tread of the coast, seeking the open water."

Dr. Kane is of opinion that there is an internal sea at the North Pole, so that if successful in his journey the problem of the north-west passage will be settled. We shall be rejoiced to find that an American has succeeded in discovering what has foiled so many bold navigators. The existence of such a passage Dr. Kane proved to be the case from many corroborative facts instanced by other travellers and geographers.

Dr. Rea has likewise been commissioned by the Hudson's Bay Company to the command of an overland expedition. The party is to consist of one officer and twelve men, including two Esquimaux interpreters, in two boats, the one boat light and small for convenient transport over land, and for river navigation, the other large, strong, and well fitted for encountering rough weather in an open sea, but without any deck or other covering, except tarpaulins. The provisions will be sufficient for three months. Orders have already been transmitted to York factory in Hudson's Bay, (the starting point of the party,) for the boats to be built, and for twelve picked men to be engaged.

This expedition will leave Canada for the north at the latter end of April, it is not, however, sent in quest of the lost navigators, but as an exploring party.

Sea Island Cotton.

MESSRS. EDITORS—In No. 13, page 101, of the Scientific American, you have an extract from the "American Cotton Planter" that is now incorrect—it may have been true twenty-five years ago, but there is a planter living in Thomas County, this State who has been making Sea Island cotton twenty-two years in the same county, and his samples have been pronounced equal to that grown upon the islands alluded to in your extract. This county is at least 125 miles from the Atlantic coast, and perhaps varying from 50 to 100 miles from the Gulf, north; besides, if the author of your statement would visit the fertile counties of Middle and West Florida, he would find more long and "world-renowned" cotton growing than any other. I wish to acknowledge the correctness of the historical part of the communication, but will state that Sea Island Cotton can not only be grown successfully, as stated, for a belt of fifty miles width on our Southern State line, but also all over the fertile plains of East, Middle, West, and Peninsular Florida. HENRY L. WEEKS.

City of Columbus, Ga., 1852.

Camphene Explosion.

On Saturday evening, the 17th inst., J. F. Plummer, of Boston, while drawing some burning fluid from a cask, ignited it with a lamp, when an explosion followed, by which he was burned so severely that he died next morning. It is our opinion that such an accident would not have occurred had he been a reader of our paper, because the cause of such accidents, and the way to avoid them have been so clearly explained in our columns

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NEW INVENTIONS.

Pianoforte Action.

Sebastian Kook, of New York City, has taken measures to secure a patent for improvements in the above. This action differs from those in common use, in striking downwards instead of upwards. In those actions which strike upwards, the jack acts upon the hammer at a point near the pivot but a long distance from the hammer-head. The hammer shank in that case being a lever of the third order, and requiring the application of an amount of power sufficient to raise several times the weight of the hammer. But in this improved action, the power required to make the hammer operate is only what is necessary to overcome the small excess of force in a spring which raises the hammer upward when the key is not in operation. But when this latter is touched, the point of a jack connected with it is brought in contact with a projection on the hammer butt, which is thus released and gives the downward blow. It will be seen that, by this new arrangement, a much lighter touch will produce effect than by the ordinary method, and that a sharper blow can be given. Moreover, the absence of the multiplied weight of the hammer makes the action to play more freely and insures a quicker repeat. There are several other ingenious contrivances for regulatiug the action and sound, besides those enumerated, and the improvements are applicable to musical instruments provided with strips or bells of glass as well as to pianofortes constructed with strings.

Improved Plow.

Measures to secure a patent for improvements in plows have been taken by J. B. Wilder, of Belfast, Me. The nature of the invention consists in employing a revolving mould-board, so arranged and attached to the share and land-side plate, that it may be turned independently of the share, which also revolves. By this improvement both the mould-board and share can be shifted to either side of the land-side plate, so that the dirt or sod may be turned in either direction. The object in making the mould-board in this manner is to allow of its having an independent motion irrespective of the share, which hitherto has not been done. In every improvement of this kind, with revolving share and mould-board, the two have been always connected, so that the efficacy of the latter has been materially sacrificed in order to make it suit in the opposite positions to which it may be required to be altered.

Excavating Machine.

A machine for the above purpose has been invented by William Provines, of Columbia, Mo., who has taken measures to secure a patent. It consists of a frame supported upon four wheels having in front a smaller vibrating frame, which sets in motion, by a series of cog wheels connected with the back axle of the former, a wheel called the cutter wheel. To this last named are attached the cutters, which are arranged in pairs, one having a vertical and the other a horizontal movement, so as to loosen completely the earth upon which they are operated. Behind them are placed the scoops for gathering the dirt, which can be adjusted at different angles, and are worked by levers attached to the cutter wheel. According as the scoops are set the dirt may be thrown either to the right or left of the cutter wheel, or in both directions, as desired, and the cutter wheel may also be elevated or depressed so as to act upon the ground or not, as occasion may require.

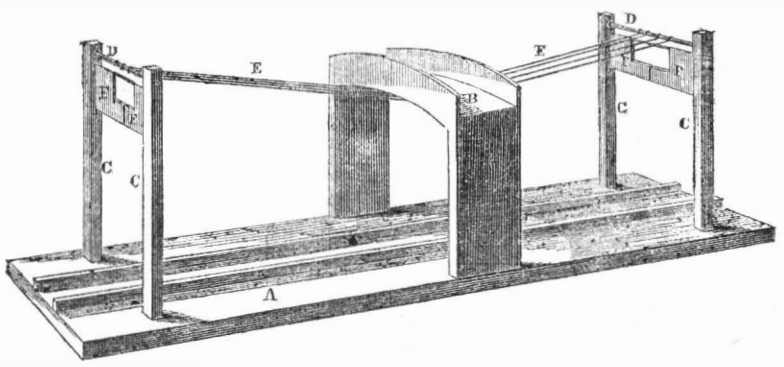
Improved Card Case.

To supersede the ordinary case at present used for holding visiting cards, a very ingenious improvement has been invented by James Carter, of Brooklyn, N. Y., who has taken measures to secure a patent. It consists in employing two thin metallic or other plates inside the card case, which are connected by a spiral spring; this spring is made to press against a slide provided with a lip at the end, so that by its pressure a card is forced up ready to be drawn out. In the common card case there is no provision for this purpose, so that it is very difficult, and often impracticable to draw out a single card when it is required, an inconvenience which is happily remedied by this neat contrivance.

Zinced Cards.

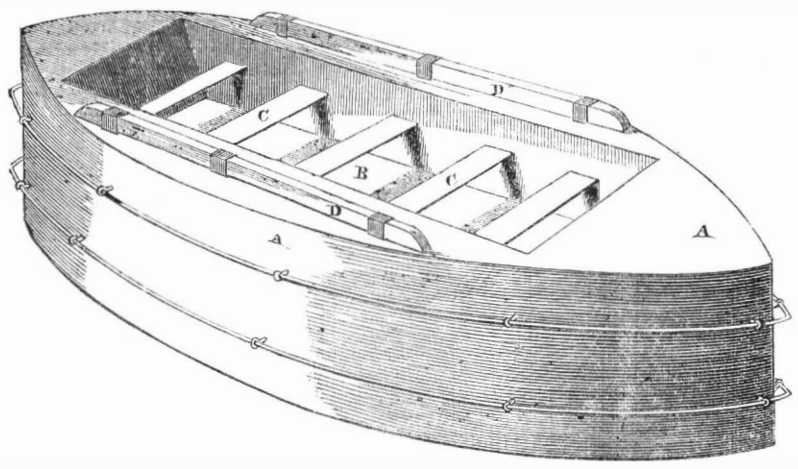
We have a card before us, the enamel of which has been put on by zinc white instead of the old lead enamel. The zinc used was that of the Ville Montagne Co., of Belgium and France, F. Milleroux, No. 33 Broadway, N. Y., general agent. The card is very beautiful, surpassing, we believe, those enamelled with white lead, and is certainly less poisonous.

SAFEGUARD FOR RAILROAD BRAKESMEN.



There is no class of men employed on our railroads, not even excepting the engineer, who are more exposed to accidents than the brakesmen who accompany the trains. These railway "employes" are generally stationed, especially when with freight trains, on the top of the cars, and from their elevated position are very liable to injuries, or to be struck off and perhaps killed, as the train is passing under bridges. It may appear, upon hasty consideration, that for such contingencies no peculiar provision is required, as the brakesman can easily see when to avoid such obstacles, but experience has shown to the contrary. The brakesman may be so situated as not to behold his danger, and only be aware of it when too late; moreover his attention is oftentimes obliged to be directed to other matters connected with the train, so that he is not looking in a forward direction. For these and many other reasons, a very ingenious contrivance has been invented by Hiram Littlejohn, of Taunton, Mass.; it consists in suspending at some distance from either side of the bridge by means of a suitable apparatus, as shown in the accompanying illustration, two movable wings, F F, made of some light material that cannot do any injury by the consequent contact. Supposing, for example, that the train is proceeding along the railroad, A, when at a short distance from the bridge, B, the inadvertent brakesman on the top is warned of his danger by touching the wings, F F, and thus has time to incline his body before passing under the bridge. These wings are connected together by a cord or band of some elastic substance, and turn on hinges fixed to the uprights, C C; D is the cross-piece uniting the uprights, and serves for holding the wires, E, which are extended from one side of the bridge to the other. By this arrangement the brakesman is not only warned of his danger, but actually compelled to take care of his safety, as the wires overhead are an insuperable obstacle to any part of his person coming in contact with the bridge.

TEWKSBURY'S LIFE-BOAT.---Fig. 1.



Phineas Burgess, of East Boston, Mass., and Daniel Dodge, of New York City, have taken measures to secure a patent for improvements in the above, the original patent for which was issued in 1849 to Geo. P. Tewksbury, of Boston, Mass.

Figure 1 is a perspective view of the boat, showing its position when floating on the water. Fig. 2 is a longitudinal, and fig. 3 a transverse section of the same.

A is the hull, and consists of a water-tight vessel, of metal or any other suitable material possessing sufficient buoyancy to float on the water, and is furnished with any number of water-tight compartments, which may be placed at the sides or ends—in this engraving they are not represented. B is the bottom, or rather platform, for the crew and passengers, who are seated on the thwarts, C C. This platform serves as a division for the boat, which is, in fact, double, the underside being an exact counterpart of the upper side, so that, if it was reversed, and the under part uppermost, there would be a similar arrangement as shown in fig. 1. In the original patent this platform was movable to suit the side of the boat that was upward, but in the improvement this part is fixed. D D are the keels, one on each side, in which the rowlocks for the oars are placed. There are likewise two rods running entirely round the boat, for people in the water to hold to and to assist them in getting on board. Fig. 2 exhibits the internal economy, and shows the arrangement of the platform, B, thwarts, C C, and that portion of the hull, A, in close proximity to these parts.

Figure 2.

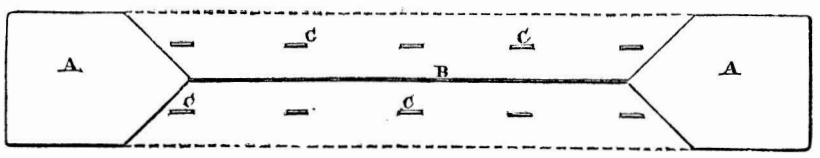
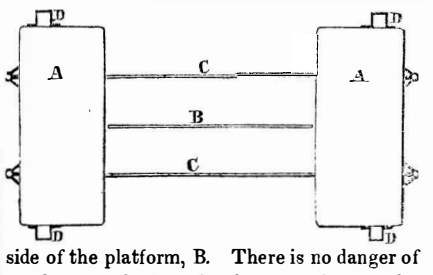


Fig 3 is a transverse section of the boat, in which the arrangement of the platform, B, can be more distinctly noted. The platform, it will be observed, does not touch the sides of the hull, A, but allows of a small opening between the two; this latter is for getting rid of any water that may happen to be shipped, which will run out by the apertures on each

Fig. 3.



side of the platform, B. There is no danger of much or any leakage by these openings, as the life-boat is made sufficiently buoyant to keep on the surface of the water, and indeed they act as a means of showing when the boat has a full complement on board, for the leakage inside would show how much the boat had sunk beneath the surface.

As it has been already stated, this improvement resembles, in its general character, that for which the original patent was granted, but differs from it in the fact of the floor being fixed instead of movable; moreover, the thwarts are secured in the boat at fixed points on opposite sides of, and at equal distances from, the floor. These improvements simplify, considerably, the construction of the boat and render its efficacy more certain by the absence of all movable parts, whose failure to adjust themselves properly might be attended with much inconvenience and danger.

The great advantage offered by this improved Life-boat arises from its peculiar construction, as in whatever position it may be launched, it will always come the right side up. A life-boat of this kind, 18 feet long, 6 feet beam, and 3 feet deep, will carry 50 souls, and as many more can, in case of necessity, hold to the life-rods.

Further information may be obtained by letter addressed to the above-mentioned gentlemen.

City Omnibus.

In No. 14 of our present volume we noticed an improvement made by M. G. Hubbard, of Rochester, N. Y., in the construction of carriage-springs, and expressed an opinion that the beautiful principle of Mr. Hubbard's invention in rendering wood available for springs, would form an epoch in the history of carriage-building. Although this conclusion has been sanctioned by all who have seen the operation of this improvement, when applied to light carriages, as shown at the late Fair of the American Institute, yet, in its application to a city omnibus, capable of carrying two tons, its advantages become more apparent, because there is greater scope to display the perfection of the self-adjusting principle. Such an application of the improvement we have had the pleasure of seeing and testing.

Mr. Hubbard has been in town since the Fair, superintending the construction of an omnibus arranged on his principle, and when completed he gave us the satisfaction of testing it in company of a number of gentlemen interested in the improvement of those vehicles: and we can truly say that we have seldom seen a "first experiment" meet with such decidedly satisfactory results. We have never seen a spring that would carry the body so steadily when the load was so unequally distributed, and it is obvious that there has been no spring heretofore invented so admirably calculated to remove the rapid vibrations of the carriage parts in rolling over our pavements.

These results have not been attained at a sacrifice of other objects equally desirable—for among the principal merits of the improvement, as we view it, are its superior strength, lightness, and economy in cost.

Our present omnibus springs convey too much vibration to the body of the vehicle, and considering this and several other important defects in the present omnibus, as well as the vast number of passengers that daily use them, we may congratulate the public on the prospect of any improvement in their construction.

We understand that Mr. Hubbard is at present constructing an omnibus and several different styles of light carriages for exhibition at the World's Fair, by means of which he, no doubt, will be able to bring before public notice his meritorious improvement as it deserves

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Scientific American

NEW-YORK, JANUARY 1, 1853.

The New Year Congratulations.

Having stepped over the threshhold of another year, it becomes us to consider well those great subjects of moral and religious obligation which should so emphatically characterize our nation in its onward march to greatness and renown: an intelligent people are eminently responsible for the influences which they exert upon those less fortunate,—and it is to the developement of religion, morality and science that the world is altogether indebted for its slow yet sure regeneration. In our humble sphere we have endeavored, faithfully, to discharge our duties in these particulars, and especially have we sought to furnish a comprehensive and valuable epitome of the rapidly developing genius of the country, as directed to Art, Science, Mechanics, and Invention.

We should be ungrateful were we to forget our sincere obligations to the steady and generous patrons whose support, since the commencement of the present volume, is particularly flattering. and we embrace this—a favorable moment—to wish all our readers "A Happy New Year," and with it the choicest blessings which a benignant Providence can bestow upon man.

When we commenced the present volume our edition was increased nearly five thousand copies, under the expectation that we should be able to supply the back numbers until its close, but such has been the demand, that we now find ourselves destitute of several numbers—breaking our regular and complete files.

The present, however, is an excellent time to subscribe;—the long winter evenings cannot be more profitably employed than by studying the works devoted to science and art—and of this class we may, without arrogating too much, recommend all to subscribe for the 'Scientific American,'—a work which the publishers always intend to store with valuable truths suited to every age and condition.

The toils of Editors are varying from the earliest gray of the morning to the weary hours of night, when nature demands repose—all this is done to benefit the world, under an expectation of a decent remuneration which seldom comes until after the door at the end of life's passage has been closed and bolted for ever. We, however, mean to labor while we can, and study to render our efforts more worthy of the continual approbation of our patrons. To achieve this we need the active co-operation of true friends—we shall have it.

Commencing this week we have increased our edition, and shall be prepared to supply the numbers from this date to a host of new subscribers. We should not forget to remind all those whose term of subscription expires with the 1st of January, that we shall be pleased to have them all renew—of this, however, we borrow no particular trouble.

Mechanics Respect Yourselves.

In our last number we had a few words to say about Intelligent Mechanics, and we propose now to address a few words to young mechanics. It is a fact that no class of our citizens are more useful, yet for all this, usefulness does not confer upon any man what is now called *respectability*. There can be no doubt but wealth is a popular false standard of respectability. and it is just as aristocratic an element here as elsewhere. Listen to what James T. Brady, Esq., said in a lecture delivered before the Mechanics' Institute. in this city, on Tuesday evening last week. He said:—

"It was a curious fact that, although civil liberty was first recognized in Great Britain, yet even there, from the system of classifying the people, the mechanical classes are subject to great hardships and disadvantages, and even in our own country, that boasts of the most liberal intsitutions in the world, the mechanic has not his proper position among us. The lawyer, the merchant, and the other professions, all assume to place themselves above him. The lecturer then referred to certain classes of society in this country who assumed the airs and attempted to tread in the footsteps of the aristocracy of Great Britain, and ridiculed their pretensions. When we look, said he, to the aristocracy of Great Britain, their antiquity, and the structure of their government, we cannot help acknowledging that they have at least a tolerable claim; but when a class of persons in this country, without either antiquity, rank, lineage, or any other distinction to ennoble them, assumed a position in the social scale above their fellow-citizens, it was an arrogant assumption on their part, that merited the utmost contempt. The lecturer then passed a high eulogium on the mechanics of this country, and insisted that from their usefulness, they were entitled to the highest position among us—they built our houses, our ships, our railroads, and by their genius, their energy, and their industry, were the largest contributors to our greatness."

What Mr. Brady here stated is true in respect to usefulness, but why do the mechanics not command the same respect in community as the lawyers. Mr. Brady is a lawyer, would an association of lawyers engage (or have to engage) a mechanic to lecture to them about their duties, worth, and influence.—These are important questions, and sound away down to the very core of the cause, "why our mechanics do not exercise influence, or command respect according to their usefulness." In looking over the names of lecturers engaged to speak before the said Institute, we do not see the name of a single mechanic. Why is this? the reason is obvious, they are not distinguished for literature as they are for usefulness, and it is the civil quality which commands respect. Another thing is, they do not in general respect themselves (we mean true respect,) as they should do. We have received a very great number of letters from mechanics—men of the right stamp—from different parts of our country, all lamenting the general apathy in respect to useful learning manifested among our young mechanics. One says, "Sunday is spent by the most of them ¶n reading falsehoods in the shape of exciting stories, destitute of plot, purity, or literary taste." Another says, "they read everything but what they should read." Another says, "they talk about everything but that which they should talk about, such as impure stories, bandying jests, &c., instead of conversing about religion, philosophy, history, law, science, and practical mechanics."

There is much truth in these statements, and we sincerely desire to arouse our mechanics to a true sense of their faults and failings. In every village and city in our country they should associate together for mutual improvement, and such societies should not be exclusive. It is best to mix with all classes, but avoid debating clubs—in the aggregate they do evil. Mechanics should read good and useful periodicals and books—works that try the mind and exercise its reflective powers; and they should endeavor to cultivate a purity of speech and conduct equal to that of the most refined and educated. The composition and reading of short papers on useful subjects is a most excellent plan for mental improvement, and we would recommend this system to the adoption of every Mechanic's Institute in our country; the members should all engage in this task. We remember at one time speaking to a tailor, a very intelligent and smart one too, about delivering a lecture on his trade before a Mechanic's Institute with which we were connected. "What," says he "on my trade? what could I say of it to make a lecture of." We answered, "there is no trade which has a wider field for making an interesting and useful lecture; you can draw very well, have your blackboard beside you, and make out some large pictures of the costumes of the people of different nations; the old Roman with his toga, the Indian with his blanket, and the modern beau with his frock-coat, flowered vest, tight pantaloons, and little pot-hat." He saw at once the field which he had for a subject, and he was perfectly qualified to point out the geometrical rules which governed the shapes and cutting of his cloth. Every mechanical trade has a wide field for investigation, and study. Mechanics, be up and doing, "quit yourselves like men." This advice is principally given to our young mechanics, those who have so much leisure time and who generally waste it so recklessly, but it is also applicable to men of all ages. Our mechanics have genius, industry, and quickness of parts, our object is to direct them aright.

Cheap Gas for the City.

There is some prospect of this city being yet supplied with gas light at a much less expense than it now is. A company has been formed that is named "The New York City Mutual Saving Gas Light Company," which proposes to supply our city with gas made under the patent of Henry W. Adams, which was granted on the 10th of last August, the improvement of which consists mainly in feeding into the retorts melted resin or tar from the tank, &c., while the retorts are still heated; thus saving a great quantity of fuel, labor and time.

As gas is at present made, one ton of coal, of 2,240 lbs., of ordinary quality, will make 9,200 cubic feet of gas during four hours distillation, and 11,120 cubic feet in six hours distillation. About 190 lbs. of coal tar are produced from a ton of coal in the tank, which tar contains a considerable quantity of illuminating materials, such as benzole, &c., but which is now *a refuse*. After the first hour's distillation of coal, the quantity and quality of gas diminishes every successive hour, hence, although 112 lbs. of coal will produce 80 and 16 cubic feet of gas in the fifth and sixth hours (it produces 150 feet in the first) it has been found more profitable to work the retorts only 4 hours, losing 96 cubic feet of gas, because its quality is so inferior. The improvement consists in supplying the retorts while in the act of distillation with fresh hydrocarbon such as pumping the refuse tar into the retorts, so that gas of the first quality can be distilled during the whole six hours of the retorts' working. A great saving of fuel and time is thus effected, consequently gas can be produced by the new process at a much less cost. Either oil, resin, &c., or coal tar, can be supplied while the retorts are working. The improvement appears to us to be a good one.

The company has received a charter, and only asks the privilege of laying down their pipes in the city and supplying all those who may desire to purchase their gas. They ask no special grants of patronage; they trust in their patented improvement to make and sell the gas cheaper than our present companies. If the company proposed no reduction in the price of gas, we would not say a word about their proposition, but since a proposal is made to benefit our people, we hope onr Common Council will act for the public benefit.

The company say they will guarantee a supply to every public lamp at $1,25 per one thousand cubic feet, and to private customers at $2,50 per thousand feet, a reduction of sixteen and two-thirds per cent. There is a great difference in the quality of gas, a reduction in price according to the quantity being no test of cheapness; the new company therefore guarantee the best quality of gas for this price. We being advocates of every improvement for the general benefit, cannot but commend the subject to the public, no monopoly is required, only a clear field and no favors.

Efficacy of Heating Surface in Boilers.

The editor of the London Artisan. in the number for December, endeavors to impress upon the minds of his readers, the importance of studying the question of the relative values of different kinds of heating surfaces. He says:—"We feel convinced that a boiler yet remains to be invented which will be as superior to the present tubular boiler as that is to the old flue boiler. Rich will be the reward of the inventor who can supply the want of a boiler which shall possess all the advantages of the locomotive boiler, without those faults which unfit it for the purposes of steam navigation." What an amount of startling truth there is in these few quoted lines. And to show what a difference there is in the value of some of the boilers in our steamships, we quote as follows from B. H. Bartol's work on Marine Boilers. "The Susquehanna, U. S. Navy, designed by Charles W. Copeland, Engineer, has boilers which for every pound of coal evaporate 8 4-10 lbs. of water. The boilers of the Mississippi, designed by the same gentleman, evaporate 5 77-100 lbs. of water by one pound of coal. The Saranac (same designer,) evaporates 8 lbs. of water by one of coal. The Princeton, designed by John Ericsson, evaporated 4 1-3 lbs. of water by 1 lb. of coal. The Georgia evaporates 7 3-4 lbs. of water with 1 lb. of coal, designed and constructed by T. F. Secor & Co., N. Y. The Washington evaporates 5 32-100 lbs. of water by 1 lb. of coal; designed and constructed at the Novelty Works, Messrs. Stillman, Allen, & Co., N Y. The Atlantic evaporates 7½ lbs. of water by 1 lb. of coal, Messrs. Stillman, Allen, & Co., engineers. The Baltic and all the Collin's Line the same: the boilers were designed by John Faron, Chief Engineer, now deceased. The Monumental City evaporates 8 lbs. of water by 1 lb. of coal; boilers by Murry & Hazlehurst, of Baltimore. The Vixen, U. S. Navy, 4½ lbs. of water for 1 lb. of coal, built at the West Point Foundry. We have quoted enough to point a moral in respect to boilers. The North River boats do not seem to have boilers which evaporate more to the coal employed than some of the steamships; in fact some of them much less, and not one of them comes up to the Susquehanna or Monumental City. In the duty performed by a pound of coal in the boilers of the several steamships quoted, there is a difference of nearly one hundred per cent. between the Susquehanna's boilers and those of the Vixen. What a variety of results; what an expensive steamship in respect to fuel was the Princeton in comparison with the Saranac. No wonder improvements are desired; these statistics show how much economy there is in the construction of the boilers of one steam ship over those of another—the expense of fuel about one-half less. There is certainly something to learn and something to be invented in the boiler line to reduce the expense of fuel. We have no doubt but steam boilers will yet be built, which, with 1 lb. of coal, will evaporate 10 lbs. of water, and do so as rapidly as those which do not now evaporate more than 5 lbs. of water with 1 lb. of coal. Some of the pumping engines in Cornwall consume only 3 lbs. of coal per horse power in an hour, a cubic foot of water (62½ lbs.), or evaporate about 20 lbs. of water for one of coal. There is certainly great room for improvements yet—much heat is wasted—actually thrown away, recklessly and stupidly in most boilers owing to the imperfect manner in which they are constructed.

Dry Rice and Mantchourian Cotton.

On the eve of the departure of the Japanese expedition, we beg leave to direct the attention of the President to the agricultural productions of Mantchouria, of which M. Huc, in his travels lately published, gives the following account. We quote from Haslett's Translation, Vol. 1, page 105:—

"Mantchouria, watered by a great number of streams and rivers, is a country naturally fertile. Since the cultivation has been in the hands of the Chinese, the soil has been enriched by a large number of the products of the interior. In the southern part they cultivate successfully the dry rice, or that which has no need of watering, and the imperial rice, discovered by the Emperor, Khang-Hi. They have also abundant harvests of millet, of Koo-Leang or Indian corn (Holcus Sorghum,) from which they distil excellent brandy; sesamum, linseed, hemp, and tobacco, the best in the whole Chinese Empire.

The Mantchourians pay especial attention to the cultivation of the herbaceous-stemmed cotton plant, which produces cotton in extraordinary abundance. A meou of these plants, a space of about fifteen square feet, ordinarily produces 2,000 lbs. of cotton, the fruit of the cotton-tree grows in the form of a cod or shell, and attains the size of a hazel nut. As it ripens, the cod opens, divides into three parts, and developes three or four small tufts of cotton which contain the seeds. In order to separate the seed, they make use of a sort of little bow, firmly strung, the cord of which, vibrates over the cotton tufts."

This account of the production of cotton is certainly erroneous; it is probably an incorrect translation from the original, which we have been unable to procure. But, making all possible allowances for possible exaggeration, when we consider that the southern boundary of Mantchouria is as far to the north as the city of New York, it is hardly possible to over-estimate the value of so important additions to the staple productions of our northern States.

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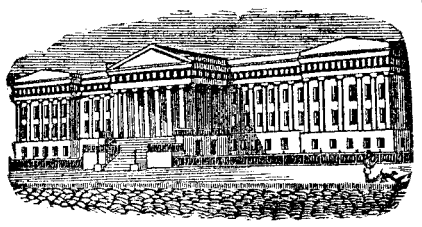


Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING DECEMBER 21, 1852.

RAKES TO GRAIN HARVESTERS—By Jearum Atkins, of Chelsea, Ill.: I do not confine myself to the exact mechanical devices and arrangements described, for operating the rake, as they may be modified, or others substituted for them.

I claim the combination of the crane post, rock-shaft, and crank, to operate the jointed arm and hands, which collect the grain in gavels, and deposit in rear of the harvester, as specified, as the machinery moves forward, when applied to machines for harvesting any grain which requires to be collected and deposited, the combination being connected by gearing with the driving wheel of the harvester, and operating through mechanical devices, substantially as described, as an automaton, to perform the above specified operations.

WATER CLOSETS—By Wm. S. Carr, of New York City: I am not aware of any previous arrangement, in which an air-tight reservoir has been used, the filling or partial filling being effected by motion of the seat letting on the water, and when the weight is removed from the seat, the supply of the water is shut off, and a connection opened between the air vessel, or reservoir, and the pan or basin of the closet.

Neither am I aware of any arrangement of the parts by which the pressure of water opens the pan thereby avoiding a separate and distinct operation by hand. always subject to neglect or hasty and improper performance, by which the water has not time to act.

I do not claim any of the parts of the pan, basin, or hopper. as these may be of any desired character, and if used with the hopper closet without a pan, the parts which move the pan may be dispensed with.

What I claim is the cylinder and plunger, by which the force of the water is made to raise the lever, depressing and emptying the pan, as described.

VENTILATORS—By A. S. Dozier, of Norfolk, Va.: I do not claim a ventilator with slats or shutters fixed in the side of a cupola or dome, or other structure, placed on the top of the building, or elsewhere; but I claim the arrangement of the frame in the sides of the cupola or dome, projecting slightly beyond the face thereof, to admit the lips or turned ends of the slats or shutters, to lap over the same, in order to form tight joints, and the manner of hinging or jointing the slats or shutters, to the same by the joint pin.

Likewise the radial wings when combined with the frame of the dome or cupola, for directing the currents of air to the spaces between the slats or shutters, as described, and thence to the trunk.

STRAW CUTTERS—By Warren Gale, of Louisville, Ky.: I claim constructing the rotating cutting cylinder, substantially as described, with a series of parallel annular grooves and ridges, and a series of cutting arms or knives, in combination with a series of fixed knives, so arranged that they enter the grooves and interlock or lap past the annular ridges on the cylinder, and thereby prevent the stalks of straw, &c., from descending between the fixed knives and cylinder, without being cut, substantially as set forth.

PLOWS—By Wm. A. Gates, of Mount Comfort, Tenn.: I claim the rhomboidal plate, bent on one of its diagonals, and constructed and arranged substantially as described, so that either leaf can be used as a land-side or share, at pleasure, the edges of the share becoming, when the plate is reversed, the edges of the land-side, and those of the land-side, the edges of the share, in the manner and for the purposes specified.

Also, in combination with the plate, as described, the double bifurcated brace for attaching said plate to the beam, as described.

MACHINERY FOR HAT BODIES—By L. E. Hopkins, of New York City: I do not claim the conical vibrating rollers, for the purpose of felting or compressing a bat, or the cone, separately.

But I claim combining the hardening rollers with the perforated cone, by means of a yielding or hinged frame in which they are placed.

Also giving to said rollers, in combination with said perforated cone, a vibrating endwise motion, as well as a rotary motion.

Also blowing the exhaust air from the Former into the chamber, for the purpose described.

Also the mode of forming the steam pipe outlet, as specified, by covering the steam pipe with the cloth, and in casing it with an outer metal case.

Also covering the perforated cone, preparatory to a deposition of fur thereon, with a covering of thin cloth, easily pervious to air, upon which the fur is to be deposited, said cloth or fabric to be removed at each operation, with the hat body deposited thereon.

GRAIN THRESHERS AND CLEANERS—By J. Jones & Alex. Lyle, of Rochester, N. Y.: We claim the combination of the upright threshing and separating cylinders with the upright concave and cylindrical sieves operating in the manner set forth.

EQUALIZING APPARATUS FOR ENGINES WHICH USE STEAM EXPANSIVELY—By Wm. H. Morrison, of Indianapolis, Ind.: I claim the application to a reciprocating engine (in which the steam is used expansively) as described or equivalent toggle movement, in combination with a pair of equalizing cylinders, which being placed at a greater or less distance (one on each side of the mid-range of the toggle), the most rapid accumulation of equalizing force is made to take place earlier or later, in the stroke, in accordance with the period of cut-off, &c., for the purpose described.

MAIZE HARVESTERS—By J. L. Ream, of Mount Pulaski, Ill.: I claim the arrangement of the shaft of the receiving arms, with one end resting upon the cutter bar piece, thereby dispensing with an intermediate platform, so that the cut stalks will fall directly upon the receiving arms, and be thence discharged, in bundles upon the ground as set forth.

CUT OFF VALVE MOTION—By S. W. Rogers, of Baltimore, Md.: I do not claim placing the cut-off valve outside of the slide valve, and operating both valves by one rod or eccentric

But I claim the lugs acting upon the hinged levers, attached, at their lower extremities, to the cut-off slide, and at their upper, to a rod capable of a vibratory movement, in a direction perpendicular to the valve seat, substantially as set forth.

POTATO DIGGERS—By Jesse N. Seeley, of Forsyth' Ga.: I claim the construction of a potato-digger, by the combined arrangement of the knife, wheel, and fork, with the beam, operating substantially as set forth.

LAMPS FOR LOCOMOTIVES—By Thos. Snook & Stephen Hill, of Rochester, N. Y.: We claim, first, the combination of a feeder for supplying oil to the holder. by the combination of two tubes, one communicating with the interior of the reservoir, and the other fastened to a float immersed in the oil of the holder, by which the lamp is rendered self feeding, in the manner specified.

Second, the construction of the chimney with a broad flat flue connecting its vertical portions, the exterior one of which is constructed as to be forward, or on either side of the prolongation of the chimney of the burner, substantially in the manner and for the purpose specified.

CHROMATE OF SODA—By John Swindells, of Manchester, England. Patented in England, Nov. 14, 1852: Having now described the nature of my said invention, and the manner in which the same is to be performed, I claim the process described, for manufacturing the chromate of soda for dyeing.

FULLING MILLS—By Wm E. Underwood, of Middlefield, Mass: I claim the combination of the stop, mechanism, or its equivalent, with the screw pulley and the elastic band leading to the pulley on the upper roller, whereby the whole machine is stopped, when the motion of the cloth is arrested in the manner described, and ceases to impart motion to the upper roller.

SEPARATING IRON FROM FURNACE CINDERS—By Daniel Walroth, of Chittenango, N. Y., & Lucius Evans. of Manlius, N. Y: We claim the combination of the revolving, breaking, and sifting cylinder, with the fan, or its equivalent, substantially as specified

STEAM FLAT IRONS—By Caleb C, Walworth, of Boston, Mass: I claim the steam ball and socket smoothing iron, as made of a combination of a spherical socketed smoothing block, and a hollow or chambered sphere, with induction and eduction passages, arranged so as to admit steam and discharge condensed water, all substantially as set forth, the block being applied to the sphere in such manner that it may be moved thereon in various directions, transversely, while passing over and against a hat or surface to be moved, as specified.

PLANING MACHINES—By Aretus A. Wilder, of Detroit, Mich. Ante-dated July 17, 1852: I disclaim the invention of planing by a reciprocating plane, which planes on its forward stroke, and feeds the board on its backward stroke, as in other machines of this class.

But I claim, in planing machines of this character, clamping the board, when being fed by the backward motion of the planes, to the reciprocating bed only, so that it will be free to move over the stationary bed plate, upon which it is planed, as described.

MEASURING CLOTH ON THE CLOTH BEAM—By W. H. Woodworth, of Salmon Falls, N. H.: I claim connecting or attaching a measuring cord, constructed as described, to the cloth, so as to be wound on the cloth beam with it, in order to indicate the length of the cut desired.

SAFETY LOCK—By Linus Yale, Jr., of Newport, N. Y.: First, I claim, in combination with the tumblers, or their equivalents, constructed and connected, respectively, to stops, as described, the spring being an additional device, co-operating with the said tumblers, and springs connected therewith, in rendering the movements and positions of the stops, to the highest degree uncertain, when an attempt is made to unlock the lock without using the proper key.

Secondly, the wheel, and the lever, in combination with the tumblers, H, constructed as described, or their equivalents, to raise, while in one position, and support the tumblers, O, that the key-hole shall be equal and smooth, to receive the key, and then allow them to be stopped at proper heights, on the key, while a revolution is performed and the bolt moved by the wheel, as described.

DESIGNS.

STOVE PLATES—By S. S. Jewett & F. H. Root, of Buffalo, N. Y.

COOKING STOVE—By S. S. Jewett & F. H. Root, of Buffalo, N. Y.

HEARTH PLATE—By James Wager, Volney Richmond & Harvey Smith. of Troy, N. Y.

SPITTOON—By Washington L. & Sylvester W. Pearsall, of New York City.

Extension of a Patent.

THRESHER AND GRAIN CLEANER.—On the petition of Matthew McKeever, of Winchester, Frederick County Va., praying for the extension of a patent granted to him on the 15th of March, 1839, for an improvement in the machine for Threshing and Cleaning Grain, for seven years from the expiration of said patent, which takes place on the 15th March, 1853.

It is ordered that the said petition be heard at the Patent Office on Monday, the 28th of February, 1853, at 12 o'clock M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specifically set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing, must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

S. H. HODGES, Com. of Patents.

Washington, Dec. 12, 1852.

Compressibility of Soils.

We commend the annexed experiments of Mr. Roy to Engineers and Builders everywhere; they are very valuable.

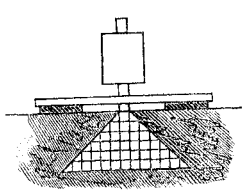
A Table of Experiments on the Compressibility of Soil of New Orleans, La.

Experiment.	Size of Bearing, in square inch.	Weight in pounds applied.	Weight to the square inch, in pounds.	Sinkage in inches.	No. days to each expr'mt.	Depth of boring or trench in inches,	Place of experiment, distance from the river, in yds.
1	¼ × ¼ = 1-16	6 375	102·000	3½	30	12	1760
2	½ " ½ = ¼	25·500	"	7	30	12	"
3	¾ " ¾ " 9-16	57·375	"	11	30	12	"
4	1 " 1 " 1	102·000	"	11	30	12	"
5	1 " 1 " 1	102·000	"	11	30	12	"
6	1 " 2⅞ " 2⅞	293·250	"	26¾	30	12	"
7	4 " 4 " 16	1632 000	"	78	30	12	"
8	1 " 16 " 16	1632·000	"	33	30	12	"
9	4 " 4 " 16	1632·000	"	120	161	48	"
10	¼ " ¼ " 1-16	1·125	18·000	⅝	3	12	"
11	¼ " 1 " ¼	4·500	"	⅝	3	12	"
12	½ " 1 " ½	9·000	"	⅝	3	12	"
13	¾ " 1 " ¾	13·500	"	⅝	3	12	"
14	1 " 1 " 1	18 000	"	⅝	3	12	"
15	1 " 1 " 1	36.000	36·000	2½	51	12	"
16	¾ " 1 " ¾	27 000	"	1⅝	51	12	"
17	½ " 1 " ½	18 000	"	1¼	51	12	"
18	2½ " 8 " 40	642 000	16·050	⅜	99	6	"
19	1 " 1 " 4	170.000	42·500	⅛	42	0	"
20	6 " 12 " 144	2552·000	17·720	⅛	107	0	400
21	6 " 12 " 144	3362·400	23·350	3-16	182	0	400
22	6 " 24 " 288	15580·000	54·097	1	48	0	300
23	20⅞ " 20⅞ " 432	18703·000	43 300	4½	26	96	400
24	12 " 12 " 144	5132·000	35·640	¾	20	96	400
25	24 " 24 " 576	23150·000	40·200	6¼	38	36	300
26	weight increased.	45724·000	70·380	13⅛	40	36	300
27	weight increased.	57600 000	100·000	18½	55	36	300
28	1 " 1 " 1	102·000	102 000	6	68	48	333
29	weight increased.	202·000	202·000	18	121	48	333
30	4 " 4 " 16	1632 000	102·000	16½	68	48	333
31	weight increased.	3232 000	202·000	54½	121	48	333
32	1 " 1 " 1	102·000	102·000	1	49	48	300
33	weight increased.	202 000	202·000	7	87	48	300
34	4 " 4 " 16	1632 000	102·000	7	51	48	300
35	weight increased.	3232 000	202·000	61½	87	48	300

NOTE.—Nos. 23 and 24 were made at the New Customhouse, by a commission of U. S. Engineers, appointed by the treasury department.

It will be seen, by the above table, that, contrary to the general opinion, a larger surface sinks more than in proportion to its area.

The above table shows that the builders of New Orleans, generally, are mistaken in two things, viz.:—that the larger surface of ground covered by a foundation, will carry more in proportion to its area than a smaller surface; 2d. That the soil of New Orleans is uniform. If we take experiment, No. 7, which was made one mile from the river, we see that it sinks into the ground 78 inches, with a weight of 1,632 lbs. and compare it with No. 30, which is the same size, and loaded in the same manner, but only 333 yards from the river, we find that it only sinks 16½ inches; showing that the deposit is nearly five times the density near the river that it is a mile back, and that a house should have its foundation in this proportion, varying with the distance from the river. Again, if we take No. 5, which is one inch square, and loaded with 102 lbs., we find that it sinks 11 inches, while No. 7, which is 4 inches square, and loaded with 1,632 lbs., sinks 78 inches, situated within a few feet of each other; showing that heavy walls are likely to give way, when built upon the supposition that "a continuous surface possesses a much greater sustaining power than the same area in detached portions."



And were the lateral resistance uniform, and the only thing to be taken into account, we would then say that the larger surface would sink into the ground four times the depth of the smaller surface. As for example, No. 28 sinks 6 inches, and if we draw a diagram, similar to the following, from the surface of the ground downwards, at an angle of 45 degrees, and divide the space enclosed by these lines into 6 deep, and 6 on each side, the bottom line will show 13 divisions, and the square of 13 is 169. Now, if we suppose that the lateral resistance to the farther sinking of this experiment be presented to the eye by these divisions, after deducting 1, which is certainly vertical, we have a lateral resistance of 168, supporting 1 vertical inch. But we find in No. 30, which is within a few feet of No. 28, that it contains 16 vertical inches, and should be supported by 16 times the lateral support of the other, which would be 2,688 lateral, and 16 of vertical support, or 2,704 inches in all, and sink four times the depth of the other, or 24 inches. But this is not the case; for No. 30 sinks only 16½ inches, and obtains a support from the figure of 1369, or 1353 lateral, and 16 vertical; which shows, all things being considered, in favor of the larger surface. But it is of small importance, when compared with the lateral support of the smaller surface.

It is customary in New Orleans, as well as elsewhere, when a break or outset in a wall occurs, merely to increase the width of the foundation, by the additional size of the break. This mode of building is very ruinous to large edifices in New Orleans, because, if a wall 3 feet thick requires 9 feet foundation, a wall of 6 feet would require at least 18 feet; and even with this base, the 6 feet wall is not as well supported by its foundation as the 3 feet wall, because its lateral bearing has not been increased on either side. When a projection of 3 feet occurs in a wall 3 feet thick, it only receives 3 feet more foundation, and very little more lateral support, so that the principal part of the building stands upon the weakest foundation. The 6 feet wall stands upon 12 feet, and the 3 feet wall upon 9 feet, so that the larger wall has a perpendicular support of two to one, and the smaller wall of three to one—the lateral resistance being nearly equal in both cases. This could be easily avoided by sinking the foundation of the projecting part below the other, until the necessary spread is obtained, thereby giving the larger wall the advantage of a superior lateral support from the superincumbent earth, which will be proved by experiment No. 31, which is the same as No. 30, only loaded with double the weight and sunk 38 inches in addition to the 16½, which is equal to 54½ inches, and rests as secure as it did with the 1,632 lbs.

I think that this also shows the advantage to be obtained by piling in our soil. However, the table speaks for itself, and every man can draw his own conclusions from its data. And it will be seen, that the principle laid down, "that a continuous surface possesses a much greater sustaining power than the same area in detached portions," is only correct when applied in proper positions; as, for example, if the ground was removed from around that portion of the earth's surface to be pressed, so as to remove all lateral support, the larger surface would be less likely to give way than the same area in detached portions, for the same reasons given above, but reversed, viz.: the smaller presents more surface to be supported by the surrounding earth; and by removing that support, a greater surface is exposed, and likely to give way. Experiments made in 1851–52. JOHN ROY.

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TO CORRESPONDENTS.

W. L., of N. Y.—The atmosphere does not exert the same pressure on every part of the earth's surface, it varies according to altitude and latitude It will not answer for operating clocks and watches.

R. L. O., of Pa —We have no confidence whatever in your invention as a self-sustaining power, but cannot enter into an elaborate argument to show its impracticability. If it works at all we can see no advantages to be gained by its adoption, and no invention is intrinsically valuable when it possesses nothing more than the character of a toy

W. V., of N. Y.—We are unable to answer your question about the engine

W. W. U., of N. Y.—You could acquire the knowledge of drawing by working under a good draughtsman in some of our machine shops, such as the Novelty Works, Allaire Works, etc.

I. M. N., of Vt.—We cannot give an opinion in regard to the practicability of your suggestions concerning balloons. You must experiment and determine this point before the public can give you any encouragement.

S. M. B , of Mass.—You are right. We know that shellac is rendered soluble by alkali in water, and it is used thus by some hat manufacturers for stiffening. We like it best dissolved in alcohol, although more expensive.

S. M., of Pa.—We have carefully looked among the English patents for Pidding's, relating to building materials, but cannot find it, we would very gladly oblige you if possible,

L. R. J., of N. Y.—We refer you to the back volumes of the Scientific American for information concerning portable gas apparatus. As to the expense of machine and cost of gas we are unable to furnish you information. The Astor House, Broadway Theatre, and Sun Office, were, at one time, lighted with gas made on the premises, but it was abandoned.

N. Y., of Ohio—We have never known of such a device as you mention. Try it and see what you are capable of doing with it.

H. L. H , of Mass.—We have none of the first numbers to send you. We sent you from No. 1 to 7 inclusive, sometime ago, and were notified that they were not taken from the office.

A. F. M , of Mo.—We do not find upon our records that any patent was ever issued to Geo. Page, on wind mills, although his name often appears in the register as a patentee of various inventions.

F. H. S., of Md.—The cars adopted are to be of such a width as to carry a certain number of passengers. and the arrangements for a continual circulation or rotation of the up and down trains are complete. There is plenty of room; the opposition was very foolish, and your letter would do no good now.

R. Y. R., of Ga.—The kind of saw must just be according to the work to be done; for large logs a reciprocating; for small stuff a circular. Use belting.

T. S. D., of Mass.—We cannot give you the information about iron ships at present, but may be able s ome time hence.

A. R. S., of R. I —There would no benefit accrue from publishing your problem; a host of letters to us, many of them conflicting would be the result. Oak and pine cannot be measured for weight by the same rule, in fact there is no safe rule for the weight of timber by solid measure. Two logs of the same wood, and of the same dimensions will vary in weight. All the rules used are only approximations, none perfect.

C. W. F., of Mass.—Whenever you prove that the earth was once a red hot body, it will be time enough to answer your first question. You do not seem to consider that water is part of the earth's surface; was it once red hot, or how came it. Where has all the heat gone to. What do you mean by cooling, what by heating.

H. M., of Ohio.—Richard Coffin, of Haverhill, Mass, obtained a patent in 1849 for a railroad gate operated by the locomotive, others have since proposed similar arrangements, yours mny be different, we cannot tell without a sketch and description or model.

J. M. S , of Pa.—Atmospheric pressure is the cause of the difference named in your letter. The air during the day is more rare than at night.

H. H. Z., of Pa.—Common hydraulic cement will answer your purpose; we know of none better.

J. G. J , of Ill.—The fact is, that so far as it regards the mechanical arrangement and operation of any machine, "the proof of the pudding is the eating of it." It is not possible for us to give the precise opinion on your point. You can add the improvements when you make an application for a patent unless you have contracted the caveat too much. The expense depends on the amount of drawings, &c , to be performed.

H. A., of Ill.—We have never heard from that model, it never reached our office.

Money received on account of Patent Office business for the week ending Saturday, Dec. 25 :—

G. S , of N. Y., $10; S. R. & H., of N. Y., $41,35; A W., of Conn., $20; W. McB., of O., $25; J. L., of L. I., $30; O. S., of R. I., $30; D. M., of N. Y., $30; F W., of O., $55; J. O., of Pa., $10; T McC., of O., $40; H. E., of N. J., $30; D. E., of Conn., $30; J. B. W., of Me., $10; W. L. W., of N. J., $50.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Dec. 25 :

B. F. C., of N. Y.; A. W., of Conn.; G. L. W., of Md.; W. L W., of N. J.; J. B. W., of Me.; S. H. N., of Pa ; J. S. Van G., of Tenn ; J. M. D , N. Y.; T McC., of O.

A Chapter of Suggestions, &c.

ALL GONE, ALL GONE.—At the commencement of the present volume, we printed 5,000 extra copies, which we concluded would be sufficient for the subsequent demand. It is now but fifteen weeks since Volume Eight was commenced, and to the disappointment of many we are obliged to announce that the entire editions of the first four numbers are all gone, and that we shall not be able to furnish the back numbers to any parties who order after this date. Of Volumes Six and Seven we have a few, complete, left, and have reserved a few sets of Volume Eight, from the commencement to supply those who have ordered and paid for the volume, but who prefer receiving it at the end of the year.

PATENT CLAIMS—Persons desiring the claims o any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office—stating the name of the patentee, and enclosing one dollar as fee for copying

PATENTEES—Remember we are always willing to execute and publish engravings of your inventions, provided they are on interesting subjects, and have never appeared in any other publication. No engravings are inserted in our columns that have appeared in any other journal in this country, and we must be permitted to have the engraving executed to suit our own columns in size and style. Barely the expense of the engraving is charged by us, and the wood-cuts may be claimed by the inventor, and subsequently used to advantage in other journals.

BACK NUMBERS AND VOLUMES—In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement —Of Volumes 1, 2 and 3—none. Of Volume 4, about 20 Nos., price 50 cts. Of Volume 5, all but four numbers, price, in sheets, $1. Of Volume 6, all; price in sheets, $2; bound, $2,75 Of Vol. 7, all; price in sheets. $2; bound, $2,75. Of Vol. 8, all the back numbers have run out.

GIVE INTELLIGIBLE DIRECTIONS—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure, but no name of State given, and often with the name of the post office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post office at which they wish to receive their paper, and the State in which the post office is located.

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15tf

EXHIBITION OF WORKS OF AMERICAN Industry at Washington City.—The first exhibition of the Metropolitan Mechanics' Institute will be opened on Thursday, the 24th of February, 1853, in the new and splendid hall of the east wing of the Patent Office, one of the largest and most magnificent rooms in the United States, being 275 feet long by 70 feet wide. To this exhibition the manufacturers, mechanics, artists, and inventors, from all portions of the Union, are cordially invited to contribute. The hall will be opened for the reception of goods on Monday, tha 14th of February, and the exhibition will positively close on or before Thursday night, March 17. Circulars, containing detailed instructions, will be forwarded and any further information given, on application (post-paid) to the Corresponding Secretary, Charles F. Stansbury, to whom all communications on the business of the Institute should be addressed 8tf

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This Lathe is capable of turning under two inches diameter, with only the trouble of changing the dies and pattern to the size required. It will turn smooth over swells or depressions of 3-4 to the inch and work as smoothly as on a straight line—and does excellent work. Sold without frames for the low price of $25—boxed and shipped with directions for setting up. Address (post.paid) MUNN & CO.
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FALES & GRAY (Successors to TRACY & FALES), RAILROAD CAR MANUFACTURERS—Grove Works, Hartford, Connecticut. Passenger, freight, and all other descriptions of railroad cars and locomotive tenders made to order promptly.
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SHINGLES, SHINGLES, SHINGLES—WOOD'S latest improvement in Shingle Machines is becoming more generally used than any other ever invented, and is unquestionably the best machine now in use; it produces shingles from all kinds of timber in a very perfect and rapid manner. Machines and rights for sale. Apply to JAMES D. JOHNSON, Bridgeport, Ct. 9tf

C. B. HUTCHINSON'S PATENT STAVE Cutting Machines, the best in use, and applicable alike to thick or thin staves; also his Head Cutting and Turning, and Stave Jointing Machines.

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SCIENTIFIC MUSEUM.

The Effects of Clothing on Skin Exhalation.

Dr. Hays Kyd, in an article in the London Lancet, presents some excellent ideas on the subject of clothing. Let a person in bed be covered with sufficient blankets to promote perspiration, and let these blankets be covered with an oil or india rubber cloth, or other impervious fabric, in the morning the blankets will be dry, but the under surface of the india rubber cloth will be quite wet. The blankets, by their dryness, show that the exhalations of the body pass through them and would pass through to the surrounding air had they not been intercepted by the impervious outer covering. "I think," says Dr. Kyd, "the deduction is inevitable that the habitual use of an impervious covering is injurious. Its effect must be to place the body in a constant vapor bath, in which the insensible or healthy perspiration is constantly becoming condensed into the form of humidity, and being prevented from passing off in its elastic and invisible form, the perspiration is thus constantly checked, and skin eruptions must be the result."

On the other hand, however, he contrasts the benefits and evils of an outer garment of waterproof for wet weather, and concludes that the waterproof garment is the most healthy then, by excluding the rain.

He thinks that it must be less injurious to check perspiration, in some degree, by a waterproof overcoat, than to get soaked with rain. There can be no doubt but waterproof fabrics may be made very light, and so formed as to be worn in wet weather, and yet allow some room for perspiration. But still they are not healthy, and should never be put on but in cases of extreme necessity.—Any person who has worn a waterproof outer garment for some time knows by experience that it causes weakness and chills. No person should wear a garment but such as allows the vapor or perspiration which is continually exuding from the skin to pass off freely. For this reason a frequent change of entire clothing conduces to health.

Clothing should be light and warm and not too tight. A happy change in the fashions (may it long continue) has taken place within a few years; it is the substitution of loose outer garments for the old fashioned, tight, close, and pinching overcoats. A short tunic of vulcanized india rubber to be thrown over the shoulders in a wet day would be very comfortable. It might be made double, with a small entrance tube, so as to be inflated and answer for a life-preserver, in case of shipwreck, &c. Such tunics might be made light and cheap, and of such dimensions as to be carried in a person's hat or coat pocket.

While discussing this subject we dare not overlook the fact that too few flannels are worn in our country, especially along our eastern coasts, where sudden changes are so frequent, and where so many cold rains fall during the winter season. Children should always have their outer garments for winter made of woolen materials. Such kind of clothing is warm, and it possesses the quality of resisting the action of flame in a wonderful manner. We often hear of children being burned by their clothes taking fire—cotton or linen clothing. The most of these accidents would be prevented if woolen clothing instead of calico was worn by children. We must not omit to mention, also, that although india rubber overshoes are excellent for walking in the street during wet weather, or when there is a thaw with snow upon the ground, they should never be worn at any other time, and should be taken off as soon as the wearer enters a house. They prevent perspiration in a great measure, and are only useful as a lesser evil than getting the feet completely wet from outside water.

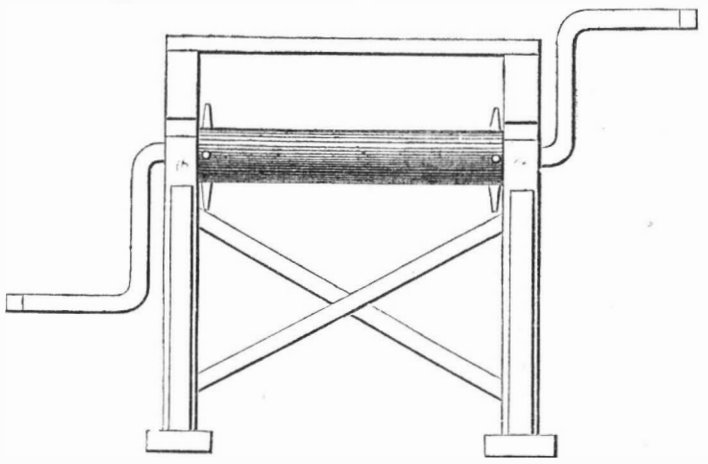
Submarine Telegraph to Prince Edward's Island.

The submarine cable to unite Prince Edward's Island with our continent by the iron cords of electric unity, has been safely accomplished by Mr. F. N. Gisborne. It is laid down between Cape Tormentine in the Province of New Brunswick, and Carlton Head Prince Edward's Island. The undertaking was difficult and dangerous at this season of the year. This is the first attempt of a submarine cable on this side of the Atlantic.—The insolution has proven to be perfect.—This line of telegraph was to have been opened to the public, all complete, on Christmas day. We are right glad to see a submarine cable successfully laid and working in some parts of our country, although our telegraph companies have exhibited a most tardy, foggy spirit about laying wires under water in many parts.

Well Sinking---Artesian Wells.

(Continued from page 120)

Figure 1 is a front view of a windlass; fig. 2 is a side elevation of the stoning up of a well for about thirty feet deep; fig. 3 is a bucket; fig. 4 is a clamp, and fig. 5 hook for the bucket to be attached to the end of the chain or rope on the windlass. In working with the windlass, there are two ropes and two buckets, so that when one is coming up the other is going down; the windlass gets a rotary motion in two different directions to produce these results—when one bucket is to be drawn up it gets a motion in one direction until it comes up to the mouth of the well or bore, and then when it has to be lowered, the windlass is rotated in a contrary direction. The hook, it will be observed, is made with a spring, so that the ring of the bucket can be at once hooked into it, and then prevented from slipping out. In "shanking," as it is termed among miners, for coal, the simple winch is employed until the bore is sunk to a considerable depth. For lifting water, two men with a windlass and two such buckets as that represented, can lift a great quantity of muddy water in one day.



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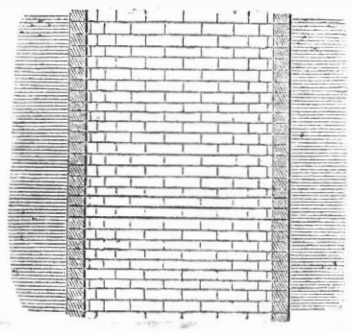

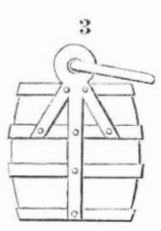

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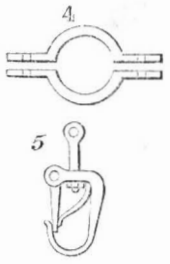

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Wells are usually of a circular form, and those which pass through strata of clay and mud should be stoned or bricked for some depth down, unless wide iron tubes are employed, which we consider the best. When common wells are dug through clay or soft earth, they should be well stoned or bricked, as shown in fig. 2. The great majority of common wells exhibit exceedingly poor workmanship. The joints should be made of hydraulic cement; the stones should be squared if stones are used; if not, the best of brick and the joints should be all perfect and firm. It is often necessary to puddle behind the bricks, especially if the earth is very soft; this is done with good clay. The bricks should be backed with stone rubble wall cemented with hydraulic mortar. The bricks should be hard and well burnt; it is a great mistake to suppose that one kind of brick is just as good as another. A hard brick has a coating like that of glass, it is impervious to moisture and decay. The most of our wells in the country are rough-stoned up, no bricks being employed; this is cheaper than using bricks and hydraulic lime; but the consequence is, that such wells require cleaning out very often, as a great quantity of sand and washings are conveyed into them by rains which soak down into the earth. It is really astonishing to see how fast rains soak into some soils, and to see how much they drink up. This is the case with all gravelly and sandy soils; they drink up the waters, and, like the horse-leech, cry "give give." It will require three courses of brick to build up a well strong and handsomely, and for no consideration should the hydraulic cement be spared in any of the courses.

In deep wells, when men are stoning up or digging down, it is very unpleasant and unhealthy, owing to the carbonic acid of the lungs being heavier than common air. Fresh air may be forced down by a bellows through a tube, or a bucket of strong lime water may be employed, and the bellows made to force the air through the lime water at the place where the men are working; the air forced into the lime water has its carbonic acid gas taken up by the lime, while the pure air escapes; it is blown in foul air, and comes out pure. All well-sinkers, miners, and those who work in deep cellars, should be acquainted with this fact in chemical science, it may save life in many instances. All that is required is simply to mix up some fresh lime to a creamy consistence, in water, and then it is fit for purifying the air by simply blowing into it with a pair of bellows.

Progress of Luxury.

The "Providence (R. I.) Journal" laments with rueful voice, the inordinate progress of luxury in our land; yet, while we agree with some of its remarks, we dissent from others. It speaks of a sumptuous mansion going up in this city, the parlor walls of which are to be covered with *papier-mache*, and this affords the ground-work of its remarks against modern luxury. We are happy to know that one gentleman has the taste and the spirit to adopt this beautiful material in the ornamentation of his building, when he can afford to do so. It is an excellent substance to withstand the drying effects of fires, &c., in our houses, and it is not so expensive as some slap-dash daubings of paint, which some people call beautiful, because gaudy.

Any person who sets up an establishment beyond his means, to have an *upish* name—one of the upper ten—acts unwisely, but those who have wealth we hate to see acting up to the usurer's mark. The journal says:—

"The sum necessary, now, to set up a young couple in housekeeping, would have been a fortune to their grandfathers. The furniture, the plate, and the senseless gew-gaws with which every bride thinks she must decorate her home, if put into bank stock atinterest, would make a handsome provision against the chances of mercantile disaster or professional failure. The taste for showy furniture is the worst and the most vulgar of all. The rich gilding, the elaborate carving, which means nothing, the ingenious upholstery, which is evidently too good for use,—how they contrast with the substantial old-fashioned tables, and with the ancestral chairs which open their hospitable arms, and offer to you the repose which they gave to your father and your grandfather. The man who would not rather have his grandfather's clock ticking behind the door, than a gaudy French mantel clock in every room in his house, does not deserve to know the hour of the day."

The bride who expects such things should be able to furnish them, and if not able, then it is sinful to ask for them. It is also wise to have something laid up for a "rainy day," but at the same time there are twenty times the amount of wealth in our country now that there was in the days of our grandfathers, so that is no rule. In the "Hall of Records," in our city, the wills of our old Dutch progenitors are recorded, and there we find vests, coats, and breeches, minutely described and willed to "my sons Jacob and Garrett," &c. Now the Editor of the "Journal" would not like to flourish about the streets with his great-grandfather's silk vest on, all flowered and ornamented; neither would he like to march about with his grandfather's old silver buckles on his shoes, and yet it is just as consistent to deride those who get new furniture, &c., and speak well of the old, as it would be to speak in the same manner about our new modes of dressing. There is, to be sure, a consistency in all things, but if all the men now living preferred to have their grandfather's clocks ticking behind their walls, instead of their own, no future grandsons could indulge in such a feeling. We like to see progress in building, dress, and everything that is not immoral. We do not, indeed, like to see old things thrown aside, merely because they are old, but because the new are better. We cannot find a single word to say against beautiful and finely ornamented houses, but to be vain of the possession of these, is an evil, and one which the wealthy should guard against, especially in our Republic.

A well has been sunk in Hocking Valley, Ohio, to the depth of six hundred feet, for the purpose of obtaining salt water, and a supply of water has been reached which requires but fifty-three gallons to make a bushel of salt of fifty pounds. The water rises spontaneously to the surface, and flows at the rate of 4,000 to 5,000 gallons per day.

MECHANICS

Manufacturers and Inventors.

A new Volume of the SCIENTIFIC AMERICAN commences about the middle of September in each year. It is a journal of Scientific, Mechanical, and other improvements; the advocate of industry in all its various branches. It is published weekly in a form suitable for binding, and constitutes, at the end of each year, a splendid volume of over 400 pages, with a copious index, and from five to six hundred original engravings, together with a great amount of practical information concerning the progress of invention and discovery throughout the world.

The Scientific American is the most widely circulated and popular journal of the kind now published. Its Editors, Contributors, and Correspondents are among the ablest practical scientific men in the world.

The Patent Claims are published weekly and are invaluable to Inventors and Patentees.

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